"Wicked" Risk

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"Wicked" Problems

- Every implemented solution has consequences.
- No well-described set of potential solutions.
  - Various stakeholders will have differing views of acceptable solutions. Correct path is a matter of judgment.
- Every wicked problem is essentially unique.
- Interlocking issues and constraints which change over time.
- Causes of a wicked problem can be explained in numerous ways.

Source: Poppendieck.LLC

Solutions to "Wicked" Problems

- Recognition as a Wicked problem
- Attempt to tame the project
  - Executive support
  - Clear problem definition
  - Separation of concerns/reduction of stakeholders
- Adaptive processes (within a systematic framework)

Source: Poppendieck.LLC

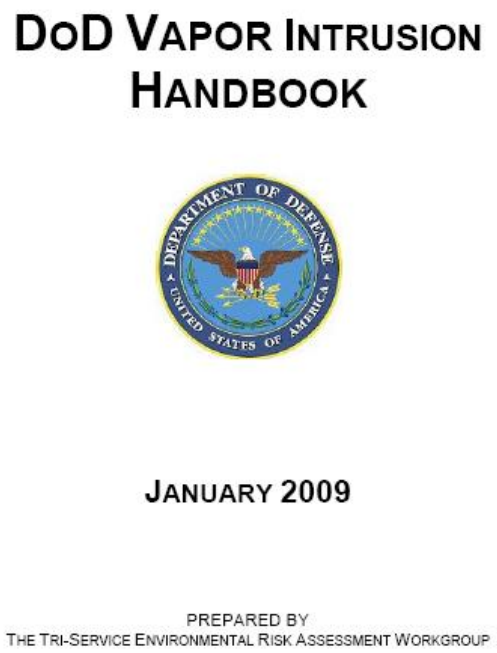
Tri-Service Environmental Risk Assessment Workgroup

Air Force, Army and Navy

- Surgeon General organizations
- Execution organizations
- Research organizations

DoD Vapor Intrusion Handbook

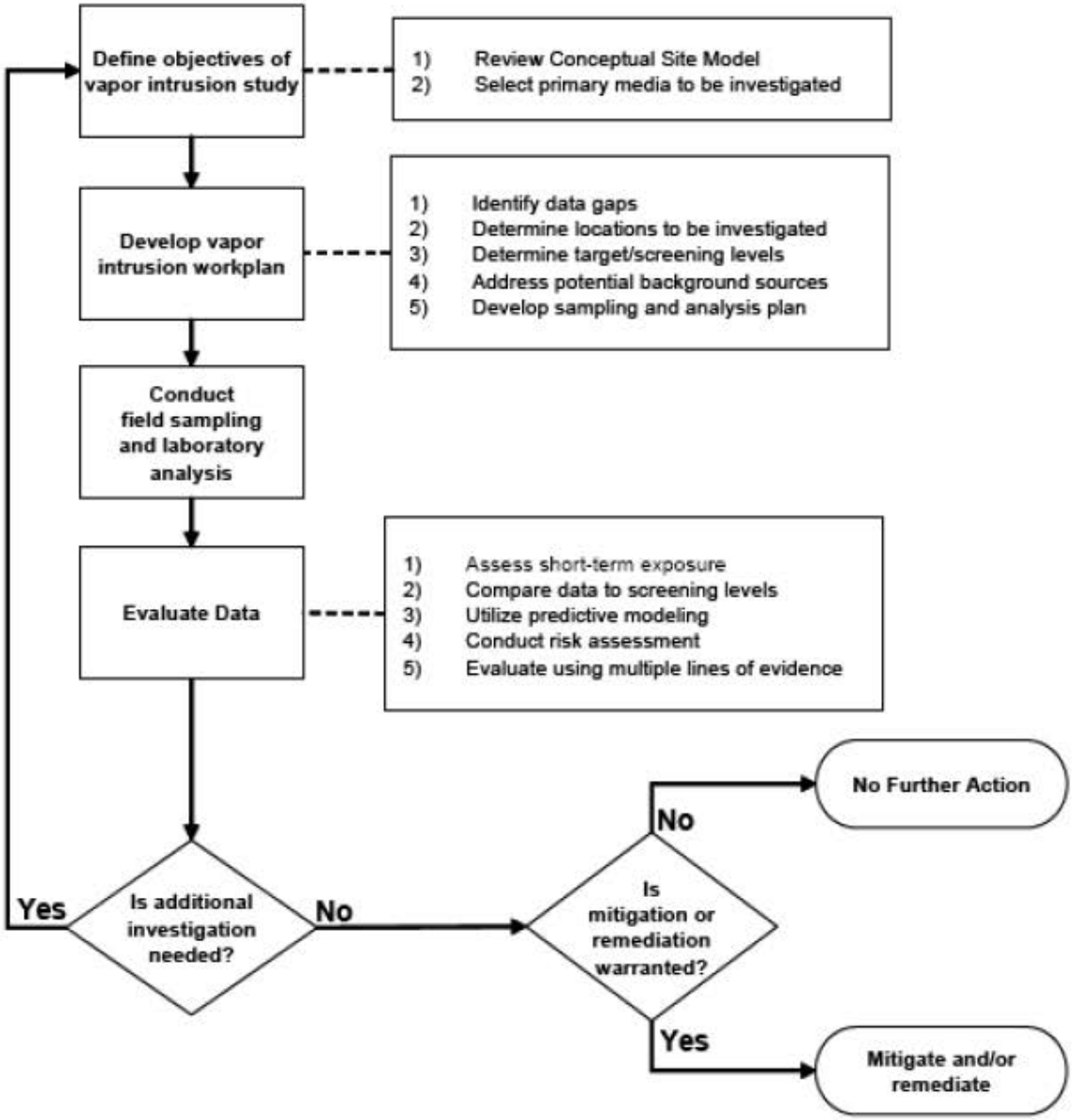
- Screening level assessment
- Evaluate acute risk potential
- Sufficiently volatile and toxic chemicals present?
  - Revised/updated EPA 2002 table consistent with Regional Screening Levels (RSLs)
  - Includes chemicals of interest to DoD



DoD Vapor Intrusion Handbook

- Site-specific Assessment
  - Sampling and analysis considerations
  - Soil, groundwater, soil gas, indoor air
    - Issues and techniques
- Risk Assessment for VI
  - Preference for actual data in lieu of modeled
  - Military exposure parameters
  - Toxicity value selection
- Risk Management
- Risk Communication

Figure 3-1: Example of the Decision-Making Process for a Site-specific Vapor Intrusion Study (after ITRC 2007a)



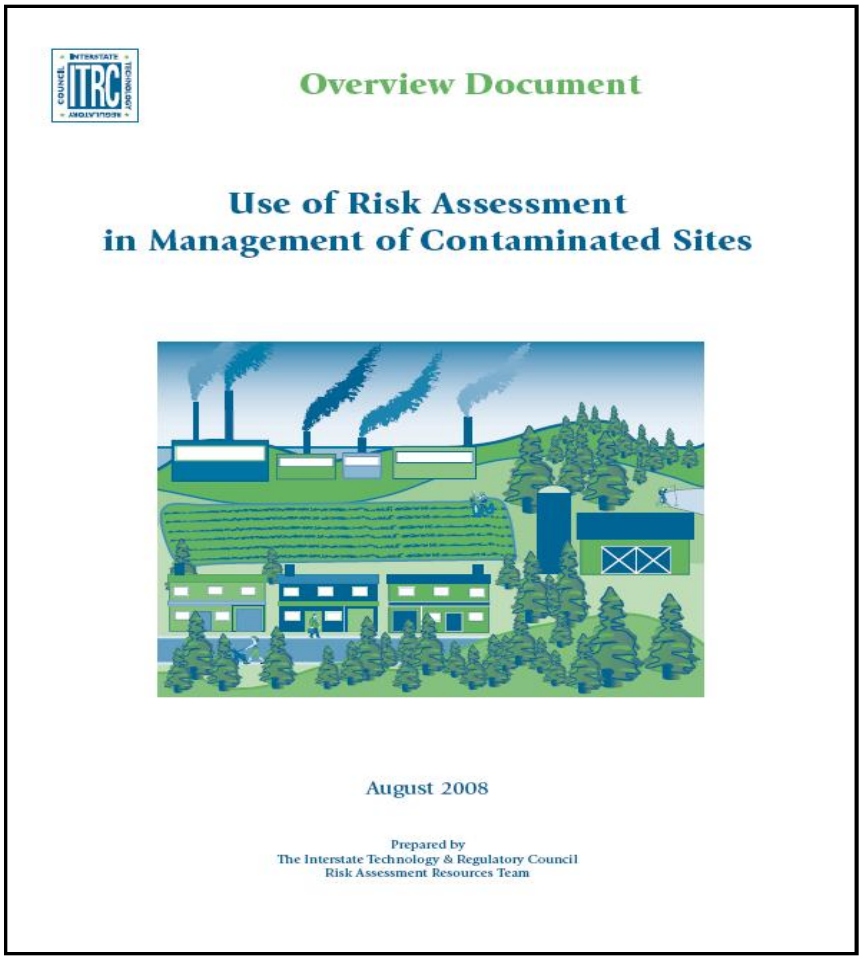
Multiple Lines of Evidence

- Soil gas data
- Groundwater data
- Fate and transport modeling
- Building construction and current conditions
- Comparison of constituent ratios of chemicals in soil gas and indoor air
- Impact of site geology
- Indoor air data
- Outdoor (background) air samples
- Results of the risk assessment
- Site or building use, ownership and control.

VI Handbook Appendices

- Sampling & Analysis Methods
  - Pros/Cons, Costs
- Occupied Dwelling Questionnaire
- Background Assessment
- Evaluating building envelope
  - Pressure differences
  - Stack Effect
- Mitigation measures

Other Activities



- Multi-Incremental Sampling ITRC team

Other Issues

- RAGS Part F
- Regional Screening Levels
- TCE in; then out again draft due next fall
  - Region 7 position
  - Region 10 position
- EPA Framework for Toxicity Assessments